DSW sets the pace and scope for critical activities to revitalize NNSA infrastructure supporting the U.S. nuclear weapons stockpile. As indicated in the Nuclear Posture Review provided to Congress in January 2002, a responsive infrastructure is a cornerstone of the nuclear triad and an important part of planning for Complex 2030. A responsive NNSA infrastructure – people, facilities, equipment, business practices, and technical processes – includes innovative science and technology research and development at the national laboratories and agile production facilities that are able to sustain the nuclear weapons stockpile and guarantee the nation's nuclear security in a dynamic and uncertain threat environment. DSW requirements drive the timing and scope for responsive infrastructure projects that focus on achieving responsiveness for selected warhead issues and assist in moving the current complex into Complex 2030. The mission is to achieve a nuclear weapons enterprise that is more cost-effective and sustainable, more responsive to stockpile uncertainties and adverse geopolitical change, discourages adversaries from pursuing threatening activities, and enables increased reliance on deterrence through capability rather than numbers of weapons.

Benefits

Within DSW, each of five major activities makes unique contributions to GPRA Unit Program Goal 2.1.26. In Life Extension Programs (LEPs), activities are working to extend the life of two nuclear weapon types (B61 and W76). (Note: The W80 LEP was terminated in FY 2006 with closeout activities completed in FY 2007). In Stockpile Systems, activities are conducted to ensure the weapon types in the enduring stockpile are safe and reliable. Work scope included in these activities are ongoing assessment and certification activities, limited life component exchange activities, surveillance activities, required maintenance, safety studies, and military liaison work for the B61, W62, W76, W78, W80, B83, W87, and W88 systems. For the Reliable Replacement Warhead, DSW activities will support design, development and project planning for the down-select option approved by the Nuclear Weapons Council (NWC) and conduct a conceptual study for additional RRW options. In Weapons Dismantlement and Disposition, activities contribute to the goal by retiring and dismantling/disposing of retired weapons and weapon components. In Stockpile Services, activities provide research, development and production support base capabilities for multiple warheads – e.g., certification and safety efforts; performing quality engineering and plant management, technology and production services; and, investigating options for meeting DoD requirements – in addition to support for responsive infrastructure implementation actions.

Background Information

In June 2004, the NNSA submitted the revised stockpile plan to Congress showing a significant reduction in the nation's deployed strategic nuclear weapons stockpile by 2012. Additionally, in March 2006, the NNSA submitted the Dismantlement Report to Congress showing a renewed effort in reducing the number of weapons awaiting dismantlement. These reductions are reflected in the quantities for the LEPs, with an increase in weapon dismantlements.

Planning and Scheduling

The DSW Program and Implementation Plans contain cost, scope, and schedule for work accomplishment. More detailed classified schedules are contained in the site Research & Development (R&D) and production documents. Stockpile maintenance, refurbishment, and life extension efforts are currently delineated in the Production and Planning Directive (P&PD) and the stockpile Life Extension Options Component Description Document. These requirements are further promulgated to the Nuclear Weapons Complex (hereafter referred to as "the Complex") through individual weapon Program Control Documents (PCDs) and the Master Nuclear Schedule (MNS). Refurbishment activities in FY 2008 will

Detailed Justification

	(Dollars in thousands)		
	FY 2006	FY 2007	FY 2008
Life Extension Program	**317,731**	**312,662**	**238,686**

NNSA developed the LEP to extend the stockpile lifetime of a warhead or warhead components at least 20 years with a goal of 30 years. NNSA, in conjunction with the applicable Service from the DoD, executes an LEP following the procedural guidelines of the Phase 6.x process. The activities below describe what research, development, and production work that current LEPs require to meet the necessary weapon military characteristics throughout the Stockpile-to-Target Sequence.

- **B61 Life Extension Program** **51,045** **58,934** **63,115**

  The B61 LEP will extend the life of the B61 for an additional 20 years. The B61 Life Extension Program includes refurbishment of the canned subassembly; and replacement of associated seals, foam supports, cables and connectors, the group X kit (e.g., washers, o-rings), and limited life components on the B61 Mods 7 and 11.

  In FY 2008, programmatic activities will focus on meeting production quantities to meet DoD delivery requirements. More specifically, the laboratories will provide production liaison support at Pantex and Y-12; this will include systems design support for the production of the piece parts and initiating necessary production definition changes to improve manufacturability and disposition instructions for production issues. The production plants will continue production rates that meet DoD requirements and the procurement and production of the foam supports, cushions, cables, refurbished cases, and nitrogen cartridges.

- **W76 Life Extension Program** **181,942** **151,684** **175,571**

  The W76 LEP will extend the life of the W76 for an additional 30 years with the FPU in FY 2007. Activities include design, qualification, certification, production plant PPI, and Pilot Production. The pre-production activities will ensure the design of refurbished warheads meets all required military characteristics. Additional activities include work associated with the manufacturability of the components including the nuclear explosive package; the Arming, Firing, and Fuzing (AF&F) system; gas transfer system; and associated cables, elastomers, valves, pads, cushions, foam supports, telemetries, and miscellaneous parts.

  In FY 2008, programmatic production activities will significantly ramp up to support DoD delivery requirements. More specifically, laboratories will provide production liaison support at the plants, this will include systems design support for the production of the piece parts to the production plants and initiating necessary production definition changes to improve manufacturability and disposition instructions for production issues, and completing qualifications to support Design Review and Acceptance Group (DRAAG) and MAR. In addition, the program will work to recover the baseline plan for purchase of materials with sufficient lead time for the material and economical purchasing strategy, fabrication of required subassembly at the Y-12 facility, and purchase of critical tooling for production capacity at Pantex. Aggressive cost control measures in FY 2007 and FY 2008 will be used as Defense Programs endeavors to meet the required delivery to the DoD in support of their Initial Operational Capability (IOC) requirements and achieve production rates consistent with the Production and Planning Directive.

(Dollars in thousands)

FY 2006	FY 2007	FY 2008

two years. Completion of these repairs is vital to maintaining the throughput of the production sites in order to meet DoD commitments. Another area of new work is the modernization of the production plant capabilities to achieve more agile manufacturing that is consistent with the Complex 2030 goals. Moreover, activities formerly within LEPs and Stockpile Systems that are more appropriately associated with internal site-specific production missions have been transferred into the Production Support category. Ongoing activities will be focused on: sustaining and modernizing engineering and manufacturing operations; quality supervision and control; tool, gage, and test equipment procurement, maintenance, and inspection; purchasing, shipping, and material support; increasing production efficiency; developing and maintaining electronic product-flow information systems; and program integration support. These activities will directly support implementation of the concepts of systems engineering and production integration in support of more cost-effective plant manufacturing and improved activity-based costing in preparation for approved increases in LEP and RRW production activities.

- **Research & Development Support** **60,958** **63,948** **33,329**

Research and Development (R&D) Support includes ongoing activities that directly support the internal design laboratory site-specific R&D mission. These activities include the basic research required for developing neutron generators and gas transfer systems, surveillance activities, and the base capability for conducting hydrodynamic experiments. The neutron generator and gas transfer research is typically beyond the basic research of a Campaign and is the first stage of technology weaponization.

In FY 2008, activities include: continue to support neutron generator development (electronic and small generator types); designing gas transfer systems, conducting qualification/certification and computer modeling and simulation activities that are required; conducting system/component surveillance evaluations to analyze results obtained from component and flight testing and preparing and providing the infrastructure for conducting hydrodynamic tests in support of enduring stockpile systems and life extension programs. Also, will support military liaison for trainers and hardware; aircraft compatibility activities, including providing avionics and interface control documentation; and studying permissive action link equipment for use control.

- **Research & Development Certification and Safety** **215,081** **194,199** **181,984**

R&D Certification and Safety activities provide underlying capabilities for R&D efforts at design laboratories and the Nevada Test Site (NTS). It includes stockpile studies and programmatic work that provide the necessary administrative or organizational infrastructure to support R&D activities. It also includes the experimental base program for plutonium and sub-critical experiments.

In FY 2008, activities include: performing surety studies to support NNSA/DoD safety assessments, which include providing technical advice/analyses and support to the Nuclear Weapons Safety Study Groups of the military services; providing the technical information and oversight for sub-critical experiments conducted at NTS; conducting plutonium experiments; providing the understanding and integration of DSW, Campaigns, and RTBF requirements are understood and integrated; supporting information technology development for archiving, data

Science Campaign

Funding Schedule by Activity

(dollars in thousands)

	FY 2006	FY 2007	FY 2008
Science Campaign			
Primary Assessment Technologies	49,221	50,527	63,527
Test Readiness	19,800	14,757	0
Dynamic Materials Properties	83,055	80,727	98,014
Advanced Radiography	49,025	36,745	30,995
Secondary Assessment Technologies	75,569	81,006	80,539
Total, Science Campaign	**276,670**	**263,762**	**273,075**

NOTE: The FY 2006 column includes an across-the-board rescission of 1 percent in accordance with the Department of Defense Appropriations Act, 2006, P.L. 109-148.

Outyear Funding Schedule

(dollars in thousands)

	FY 2009	FY 2010	FY 2011	FY 2012
Science Campaign				
Primary Assessment Technologies	59,496	55,884	57,228	58,284
Test Readiness	11,066	11,066	11,066	11,066
Dynamic Materials Properties	93,496	91,754	89,362	91,139
Advanced Radiography	32,311	33,728	32,414	32,968
Secondary Assessment Technologies	86,372	83,190	80,320	82,169
Total, Science Campaign	**282,741**	**275,622**	**270,390**	**275,626**

Mission

The goal of the Science Campaign is to develop improved capabilities to assess the safety, reliability, and performance of the nuclear package portion of weapons without further underground testing; retain readiness to conduct underground nuclear testing if directed by the President; and develop essential scientific capabilities and infrastructure.

This includes providing capabilities to support annual assessment and certification of Life Extension Programs, to support planned Reliable Replacement Warhead (RRW) designs, to improve response times for resolving significant findings, and for certifying warhead replacement components that meet the goals of responsive infrastructure. The Campaign is focused on delivering significantly improved predictive capability and tools to allow the nuclear weapons complex to increase our confidence in the assessment of the safety, security, reliability, and performance of the evolving U.S. stockpile. As a part of this, the Science Campaign is principally responsible for the development of Quantification of Margins and Uncertainties (QMU), which is the methodology that applies scientific capabilities to stockpile assessment issues, and to communicate assessments in a common framework. The Campaign focuses efforts around the development of knowledge and capabilities needed to assess the age-aware behavior of the primary and secondary components of the nuclear explosives package. The development of a more responsive infrastructure of the nuclear weapons complex in 2030 must be driven by improvement of the science and technology base to continually address and reduce the uncertainties and provide an objective quantitative measure of confidence. As the U. S. stockpile

continues to evolve due to aging, modifications from lifetime extensions, and the development of the RRW, the assessment of these weapon systems increasingly relies on our ability to assess the weapon performance using predictive capabilities that are developed and validated by the Science Campaign. The responsive infrastructure of Complex 2030 requires an agile workforce knowledgeable enough to avoid technological surprise, and to quickly understand and respond to new threats, an agility only allowed by continued support of weapons science. The transformation of the nuclear weapons complex to a highly responsive infrastructure can only be successful with continual improvements in predictive capability, and support for greater science-based understanding as done in the Science Campaign.

The advent of new Stewardship capabilities and processes provides opportunity to improve predictions of nuclear warhead performance. A new basis for planning and expected resolution of stockpile issues are a consequence of the following recent progress: application of Quantification of Margins and Uncertainty (QMU) in warhead assessments, the plutonium aging study (including extensive reanalysis of selected underground tests), delivery of greater than 100 teraflop computing power and its application in the Thermonuclear Burn Initiative, certification work for the W88 with replacement pit, more advanced radiography (DARHT), advances in high energy density physics (Omega, Z, petawatt lasers, and NIF) with expectation of fusion ignition, subcritical experiments on dynamic plutonium behavior, and design of Reliable Replacement Warheads. An important new round of experiments and computational simulations can now be planned with the Predictive Capability Framework. Particular focus will be given to the boost process and improving confidence in certification without nuclear tests. The plutonium dynamic experiments and boost emphasis will be integrated within the Science campaign while continuing to use information from all of the sources mentioned above.

The Science Campaign provides experimental data to validate the models in the simulation codes, and methodologies to apply the codes. These data and methodologies lend confidence to calculations performed to meet Directed Stockpile Work (DSW) commitments to understand the impact of aging on weapon systems, close Significant Finding Investigations (SFIs), and certify refurbished devices. The pace of work under the Science Campaign is timed to support an Advanced Simulation and Computing (ASC) Campaign milestone in FY 2010 to release substantially improved simulation codes for primaries and secondaries in support of the RRW and other certification requirements in the 2012 time frame. This shared code release will require the incorporation of improved physics models, which must be provided by FY 2009, including validated models for plutonium equation of state (EOS) and constitutive properties, improved boost physics models, completion of the Dual Axis Radiographic Hydrodynamic Test (DARHT) Facility 2nd axis as a validation tool, and the use of the High Energy Density Physics (HEDP) facilities.

The scientific advisory group, the JASONs, recently concluded a review of the progress on the second axis of the DARHT facility at Los Alamos National Laboratory. They concluded there are sound technical bases for the approaches being taken by the project. "The DARHT group is pursuing a well thought out program of fixes and testing." They have "high confidence" that the current baseline approach ... will deliver two x-ray pulses, but lower confidence that all four x-ray pulses will meet requirements. Promising approaches exist for a more capable target design, but will require further experimentation and development.

NNSA and the Office of Science plan to establish a joint program in high energy density laboratory plasmas (HEDLP), a major sub-area within the discipline of high energy density physics (HEDP), by the spring of 2007. The purpose of the joint program is to steward effectively HEDLP within the DOE

while maintaining the interdisciplinary nature of this area of science. The HEDLP program will be jointly funded by the Office of Science and NNSA. The Science Campaign will be responsible for part of this funding through the high energy density physics parts of the Academic alliance program supported from the Dynamic Material Properties

Four important budgetary changes should be noted. First, as the Inertial Confinement Fusion Ignition and High Yield (ICF) Campaign is being restructured to focus on FY 2010 ignition goals, and as a result of this joint program, the FY 2008 budget for the Science Campaign reflects the shift of important HEDP workscope out of the ICF Campaign to the Science Campaign, particularly for Primary Assessment Technologies, Secondary Assessment Technologies and Dynamic Materials Properties. NNSA's planned contribution for FY 2008 totals $12,356,000 and is included in the ICF and Science Campaigns. The FY 2008 budget further extends this increase to include funding supporting experiments on the refurbished Z (ZR) facility at Sandia National Laboratory to support dynamic materials and secondary assessment technologies. Second, the funding for the Pulse Power Technologies Program, previously provided under Secondary Assessment Technologies, was shifted in the FY 2007 budget to the Transformational Assessment Technologies activity within the Advanced Radiography subprogram, reflecting how the capability is employed for transforming the way we address stockpile certification issues to be responsive to the NNSA vision for the 2030 complex. Among other things, the Pulsed Power Technologies Program supports the optimization of the performance of the new ZR. Third, as the DARHT 2nd axis project is completed, resources within the Science Campaign are redirected to experimental programs under the Transformational Assessment Technologies subprogram to make use of new capabilities that are coming on line, including DARHT, proton radiography (PRad) at LANSCE, ZR, OMEGA Extended Performance (EP) Facility, and, ultimately, the National Ignition Facility (NIF). Fourth, Test Readiness, having achieved a 24-month goal, will be studied in FY 2007 to define a sustainable posture that enables the Nevada Test Site to field a nuclear test, if directed by the President. Current diagnostic capabilities will be maintained through efforts in the Science Campaign as well as other portions of the budget. As a result, no funds specifically for Test Readiness are requested for FY 2008, while a more forward looking program is planned.

The Science Campaign is the principal mechanism for supporting the science required to maintain the technical vitality of the national nuclear weapons laboratories, to enable them to respond to emerging national security needs, and to maintain a technological edge to prevent a national security surprise. As such, the campaign also develops and maintains the scientific infrastructure of the three national nuclear weapons laboratories and maintains a set of academic alliances to help ensure scientific vitality in important and unique fields of research. The Science Campaign also is contributing to readiness to conduct underground nuclear testing as directed by the President through the fielding of experiments and diagnostics at Nevada and at the laboratories.

The Science Campaign integrates budget and performance by setting Campaign performance targets and Level 1 (national level) milestones for primary and secondary certification that reflect national program priorities. As experience is gained in the application of the QMU methodology and as QMU is further refined, the results are increasingly being used to identify technical areas requiring improvement and to develop Level 2 (program) milestones to prioritize resources. Program success is determined by the extent to which improved understanding of important phenomena provides confidence that failure modes and margins are properly identified and the extent to which uncertainties are understood and reduced in predictive capabilities.

The Science Campaign supports activities related to science endeavors by other national and international sponsors; including for example, materials science at LANSCE and high energy density physics. During FY 2008, the Science Campaign will examine enhanced and additional collaborations that can provide improved capability to analyze and resolve stockpile issues in the future. As an example, application of the Lineral Coherent Light Source (Office of Science) for stockpile relevant science will be studied. This approach can extend responsive science capability without major new facilities.

Benefits

Within the Science Campaign, the Primary Assessment Technologies, Dynamic Material Properties, Advanced Radiography, and Secondary Assessment Technologies subprograms each make unique contributions to GPRA Unit Program Goal 2.1.27. In conjunction with the Advanced Simulations & Computing (ASC) Campaign, the Primary Assessment Technologies subprogram develops the tools, methods, and knowledge required to certify the nuclear safety and nuclear performance of any aged or rebuilt primary to required levels of accuracy without nuclear testing. The Dynamic Material Properties subprogram focuses on utilizing experiments to foster the development of detailed understanding and accurate modeling of the properties and behavior of materials used within the nuclear explosives package. It also funds university programs that support science fundamental to stockpile stewardship and develops potential future laboratory employees. The Advanced Radiography subprogram develops technologies for three-dimensional imagery of imploding mock primaries with sufficient spatial and temporal resolution to experimentally validate computer simulations of the implosion process as well as to tie these results to prior data obtained from full-scale underground nuclear tests. The Secondary Assessment Technologies subprogram develops the tools, methods, and knowledge required to certify the nuclear performance of secondaries without nuclear testing.

Major FY 2006 Achievements

Primary and Secondary Physics

- Completed the joint Primary Assessment Plan in November 2005; this plan integrates aspects that relate to understanding primary physics issues out to FY2020.
- Successfully executed Phoenix experiments EMPT-1 and FFT-1, providing data on the generator and load in support of technology development for planned FY 2007 experiments.
- Completed an assessment of plutonium aging in pits.
- Delivered a summary report of Underground Test (UGT) data analyses and system specific pit lifetime estimates.
- Provided initial data set from mix experiments on the proton radiography (PRad) facility at LANSCE.
- Produced a report containing data for development of physical model of ejecta formation and transport.
- Demonstrated use of probabilistic tools and methods to combine sources of uncertainty for primary performance assessment.
- Delivered a complex-wide (LLNL, LANL, Nevada, SNL, and UR/LLE) National Calibration Plan focusing on a coordinated diagnostics calibration plan in support of HEDP aboveground experiments (AGEX).
- Completed reanalysis of multiple underground tests with good quantitative data relevant to weapons output.

- Conducted over 200 HEDP AGEX experiments on OMEGA and Z to address materials properties, energy balance, complex hydrodynamics, diagnostics and experimental platform development, and other relevant weapons physics topics.
- Applied the QMU methodology to quantify the performance of several weapons systems.

Advanced Radiography and Test Readiness
- Provided suite of polymer and foam data.
- Qualified replacement PBX 9501 explosive; will be used for W76 LEP.
- Provided new Pu data supporting lifetime assessments and multi-phase Equation-of-State (EOS).
- Completed Damaged Surface Hydro experiment series on Atlas.
- Completed first LANL Joint Actinide Shock Physics Experimental Research (JASPER) experiment with Pu.
- Conducted First tests of Plutonium on the SNL Z Facility.
- Completed high explosive (HE) pre-shock experiments on U.
- Demonstrated utility of the Z Facility for off -Hugoniot and dynamic phase measurements.
- Completed 1% accurate density measurement and first damage measurement on PRad powder gun.
- Measured the age-dependent compressibility changes in Pu using JASPER and Diamond Anvil Cell (DAC) experiments data.
- Developed a test-bed for absolute EOS experiments at the OMEGA laser facility using radiography and measured the EOS of plastic.
- Measured the beryllium melt and phase diagram to a pressure of 70 gigapascals.
- Characterized damaged stockpile explosives for hazards response modeling- gas permeation, surface area changes, and high-pressure deflagration behavior.
- Completed a milestone on the measurement of strength using isentropic compression loading and unloading in high impedance materials.
- Brought a small cost effective isentropic compression pulser facility online at the few hundred kilobars, and developed uniform drive sources with it.
- Validated two-dimensional Magneto hydrodynamic (MHD) modeling for isentropic compression and magnetic flyers and have developed the initial pulse shapes for ZR using the latest circuit models provided by the pulsed power technology program.
- Supported 43 stockpile stewardship academic alliance grants, three congressionally mandated cooperative agreements, and five university centers of excellence nationwide, training post-doctoral fellows and graduate students in technical areas of relevance to stockpile stewardship.
- Continued DARHT second axis recovery on-schedule and on budget.
- Completed preliminary LLNL hardware testing and training of LANL personnel and helped to install all downstream beamline hardware on DARHT second axis.
- Developed a Solid State Pulsed Light Source for PRad at LANSCE.
- Completed Annual Assessment Report on Underground Nuclear Test Readiness.
- Declared achievement of the goal of 24-month test readiness.

Major Outyear Priorities and Assumptions

The outyear projections for Science Campaign total $1,104,379,000 for FY 2009 through FY 2012, which reflects an increase in FY 2009 due to the resumption of funding to maintain Test Readiness. During the period FY 2009-2012, the Science Campaign will endeavor to make significant progress toward providing the experimental data and certification methodologies necessary to support the current stockpile workload and future requirements that will include the Reliable Replacement Warhead. The

science campaign is a major contributor to the physical understanding necessary for QMU. In order to achieve this challenging goal, a balanced weapon science program is necessary that integrates the products of the Science Campaign with the simulation capabilities developed in the Advanced Simulation and Computing Campaign and the experimental tools developed in the NIF and ICF campaign. The advanced radiography sub-campaign will complete DARHT in FY 2008. Subsequent diagnostic and radiographic development will be conducted across the science campaign as necessary and appropriate.

The science campaign is planning future integrated activities to answer key questions on time scales consistent with complex transformation. In the 2009-2012 period in addition to the normal operations we expect to have to address the following high-level issues that may affect the prioritization of the budget: LANSCE refurbishment, DYNEX (scheduled for 2010), subcritical experiments at U1A (schedule and planning in development), JASPER and other operations at NTS, maintenance of test readiness as directed by Congress, and activities subject to the Complex 2030 planning and execution such as: high explosives research across the complex, Pu activities in Superblock at LLNL, and the balance of research and manufacturing activities at TA-55.

Program Assessment Rating Tool (PART)
The Department implemented a tool to evaluate selected programs. The PART was developed by the Office of Management and Budget (OMB) to provide a standardized way to assess the effectiveness of the Federal Government's portfolio of programs. The structured framework of the PART provides a means through which programs can assess their activities differently than through traditional reviews. The Science Campaign program has incorporated feedback from the OMB into the FY 2008 Budget Request, and has taken or will take the necessary steps to continue to improve performance.

The results of the OMB review are reflected in the FY 2007 Budget Request. The OMB gave the Science Campaign scores of 100 percent on the Program Purpose and Design Section, 91 percent on the Strategic Planning Section, 83 percent on the Program Management Section, and 72 percent on the Program Results and Accountability Section. Overall, the OMB rated the Science Campaign 82 percent, its second highest rating of "Moderately Effective." The OMB assessment found that the program appears to be well managed, with a clear and unique purpose and clear, meaningful, and measurable performance metrics that the program was demonstrating good progress in meeting. Additionally, the OMB assessment found that the program needs to continue to strengthen procedures to hold its contractors accountable for cost, schedule, and results. The OMB also found that NNSA should improve coordination of activities across multiple programs aimed at nuclear weapons activities—especially the six campaigns. In response to the OMB findings, the NNSA is continuing to improve contractor accountability by expanding the linkage of contractor awards to performance results/evaluation and improving communication and coordination of work across all Weapons Activities programs.

Mission

The goal of Directed Stockpile Work (DSW) is to provide the Nation with a credible nuclear deterrent by ensuring that the nuclear warheads and bombs in the United States (U.S.) nuclear weapons stockpile are safe, secure, and reliable.

Historically, the flexibility and reliability of deterrent force was ensured by a large variety of weapons, a large quantity of weapons, and frequent replacement of aging designs. But the global strategic environment changed, the mission changed, and so the strategy to support that mission changed. In place of quantity, we enhanced reliability, and in place of frequent replacement, we enhanced longevity. While several legacy warheads and bombs will need to be maintained well beyond their intended life, the Nuclear Weapons Council has determined that the Departments of Energy and Defense will shift to a Reliable Replacement Warhead (RRW) program as the strategy for maintaining a long term nuclear deterrent capability. The RRW strategy will enable a major transformation in the nuclear policy and infrastructure. From a National Security vantage, safe, secure, reliable, and sustainable nuclear weapons directly support deterrence and reduce reliance on a large stockpile of augmentation weapons. For the NNSA, RRW will allow reduced investment in legacy weapons, outdated equipment, obsolete technology, and storage of spare components. Fewer hazardous materials will enhance safety, reduce facility Environment, Safety, and Health cost, and increase producability of components. Furthermore, RRW has the potential to replace entire legacy systems. In contrast, simply reducing the quantities of a weapon yields only marginal savings due to fewer limited life component replacements because NNSA must continue to meet the safety, security, reliability, training, testing, engineering, weapons response analysis, shipping, documentation, and procedural requirements of a weapon system as long as any remain in the stockpile.

To meet the enduring needs of strategic deterrence, the nuclear weapons complex must meet national security requirements at a pace that matches the pace of evolving world events. This requires a more responsive infrastructure and a fundamental change in the culture of NNSA. The business practices and culture of NNSA must transform concurrently with facilities and equipment.

To meet this challenge, NNSA must demonstrate that we can safely improve production throughput while maintaining nuclear capabilities essential to our nuclear deterrent. As a result, our vision for the future nuclear weapons complex known as Complex 2030 is focused on production. Four key strategies will enable the transformation to Complex 2030: (1) transform the nuclear stockpile in partnership with the Department of Defense (DoD); (2) transform to a modernized, cost effective complex; (3) create a fully integrated and interdependent complex; and, (4) drive the science and technology base essential for long-term National Security.

Specifically, DSW will, in coordination with the DoD: (1) develop transition plans to shift from a Life Extension Program to a RRW program strategy; (2) while transitioning, continue to efficiently refurbish warheads/bombs to install the life extension solutions and other authorized modifications to correct technical issues or to enhance safety, security, and reliability; (3) conduct evaluations to assess warhead/bomb reliability and to detect/anticipate potential weapon issues, mainly from aging; (4) conduct scheduled warhead/bomb maintenance; (5) produce and replace components that have a limited life; (6) dismantle warheads/bombs retired from the stockpile; (7) develop concepts and programs which fulfill requirements for the Reliable Replacement Warhead (RRW); and, (8) provide the unique people skills, equipment, testers and logistics support to perform nuclear weapons operations.